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Is Hardwood Nursery Stock Available?

The amount of hardwood planting stock used in forest tree plantations in the United States is very small indeed. The great bulk of planting stock used is softwood. Wallihan (4) points out that there are several good reasons for this. First of all is the greater demand for softwood forest products. Another is the fact, often demonstrated in the past, that softwoods are much easier to establish than hardwoods. It is also well known that volume (but not necessarily value) yields from hardwood forests are considerably lower than those from softwood stands. As a result, the culture of hardwoods has not been studied so intensively as the culture of softwoods.

Nevertheless, there has been a continuing demand for hardwood planting stock, and this demand seems likely to increase. Decreases in available supplies of high-quality hardwood have resulted in rising prices for stumpage. It is evident that efforts should be made to supply our hardwood needs--in part at least--by planting hardwoods on favorable growing sites. The new Soil Bank Program may provide sites better adapted for hardwood plantations than the sites that generally have been used in the past. Foresters now recognize that hardwoods are much more sensitive to site conditions than softwoods, and require much better site preparation before planting (2).

It is known that several species of hardwoods have been grown in relatively small amounts by a number of nurseries in the past. What is the situation today regarding the current production of hardwood planting stock in forest tree nurseries?

In 1956 Abbott (1) published the results of a survey of forest nursery practices in the United States. He reported that 688,350,000 seedlings were produced in 1954 by the nurseries included in his survey. This represented 92 percent of the total forest nursery production for that year. It was based on information from 112 (69 percent) of the

public and private forest tree nurseries in the United States (3).

Of the total production, nearly 18 million trees, or slightly over $2\frac{1}{2}$ percent, were of hardwood species. Though small when compared with the number of softwoods produced, this figure indicates that a fairly substantial number of hardwoods are being grown in our forest tree nurseries. It also indicates that experience in growing them is not lacking.

In his report, Abbott tabulated production of conifers by species. For hardwoods he tabulated only seven species and one genus (*Fraxinus*). All other hardwood species were lumped together in a class called "miscellaneous."

To learn what other hardwood species were being grown, and in what amounts, the basic data for these "miscellaneous" species were re-examined and compiled (table 1). The data have been grouped by geographic regions of the United States and by species to show where the stock is being grown as well as to show the species and amounts being produced. Seven geographic regions were recognized, as follows:

1. Central - Lake States: Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Ohio, and Wisconsin.
2. Intermountain States: Colorado, Kansas, Nebraska, North Dakota, South Dakota, and Wyoming.
3. Southern States: Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee, and Texas.
4. Northeastern States: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia.
5. Southeastern States: Florida, Georgia, North Carolina, South Carolina, and Virginia.
6. Northwestern States: Idaho, Montana, Oregon, and Washington.
7. Southwestern States: Arizona, California, Nevada, New Mexico, and Utah.

Compiled this way (table 1), the data show that several hardwood species are being grown in appreciable numbers, even exceeding, in some instances, species for which pro-

duction figures were given in the survey report. Sugar maple and paper birch are two of these; they rank 7th and 15th respectively in the listing.

Table 1.—1954 production of hardwood planting stock in the United States, by geographic regions
(In thousands of trees reported produced)

Rank	Species	Central-Lake States	Intermountain States	Southern States	Northeastern States	Southeastern States	Northwestern States	Southwestern States	All regions
1	Black locust	2,913	—	643	690	157	182	17	4,602
2	Green ash	1,816	655	300	—	—	44	10	2,825
3	Yellow-poplar	1,735	—	381	10	232	—	—	2,358
4	American elm	929	689	—	—	—	16	—	1,634
5	Box elder	3	923	—	—	—	6	—	932
6	Black walnut	821	—	50	—	57	—	—	928
7	Sugar maple	285	—	—	270	—	—	—	555
8	Chinese elm	66	72	300	—	—	52	16	506
9	Catalpa	60	—	337	—	—	—	—	397
10	White ash	235	—	—	13	71	—	—	319
11	Cottonwood	4	230	66	—	—	17	—	317
12	White oak	301	—	1	—	9	—	—	311
13	Red oak	205	—	—	78	—	—	—	283
14	Red gum	195	—	—	—	—	—	30	225
15	Paper birch	1	—	—	219	—	—	—	220
16	Sycamore	146	—	57	—	—	—	—	203
17	Osage orange	70	—	100	—	—	—	—	170
18	Red maple	148	—	—	—	—	—	—	148
19	Willow Spp.	28	16	—	—	—	34	5	83
20	Black maple	78	—	—	—	—	—	—	78
21	Silver maple	33	—	—	—	—	35	—	68
22	Chestnut oak	45	10	—	—	—	—	—	55
23	Lombardy poplar	32	—	—	—	—	10	6	48
24	Flowering dogwood	32	13	—	—	—	—	—	45
25	Asiatic chestnut	—	—	—	41	—	—	—	41
26	Yellow birch	35	—	—	—	—	—	—	35
27	Swamp oak	18	—	—	—	—	—	—	18
28	Eucalyptus Spp.	—	—	10	—	—	—	3	13
29	Cow oak	—	—	—	—	3	—	—	3
30	Shumard oak	—	—	—	—	3	—	—	3
31	Cherrybark oak	—	—	—	—	3	—	—	3
32	Cork oak	—	—	—	—	—	1	—	1
Total		10,234	2,608	2,245	1,321	535	396	88	17,427
Percent of Total		59	15	13	7	3	2	1	100

It is interesting to note that the Central-Lake States region accounted for 59 percent of the total hardwood production and that 26 of the 32 species listed were reported from this one region. The Intermountain and Southern States accounted for an additional 28 percent of the production and reported 16 species. The Northeastern and Southeastern States were responsible for 10 percent of the production and reported 12 species. The remaining 3 percent of the production came from the Northwestern and Southwestern States.

Four species (black locust, green ash, yellow-poplar,

and American elm) made up two-thirds of the total production reported. The remaining one-third was divided among 28 other species.

From this information, it is evident that our forest tree nurseries can produce and are growing hardwood planting stock. Several nurseries that are not at present growing hardwood species have successfully grown them in the past. (Seven nurseries whose output consists chiefly of deciduous trees and shrubs for wildlife purposes or of ornamental planting stock were not included in this report.) From the number of species reported as being grown, 32 in all, it would seem that the major difficulties involved in the successful establishment of hardwood plantations lie in the outplanting phases rather than in nursery practices. Given the demand, our nurseries can supply a large volume of hardwood planting stock.

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